

Site Description

Study Name	CBWQ-Upper Columbia
Site	NAVEN01
Sampling Date	Sep 17 2012
Know Your Watershed Basin	Upper Columbia
Province / Territory	British Columbia
Terrestrial Ecological Classification	Montane Cordillera EcoZone Columbia Mountains and Highlands EcoRegion
Coordinates (decimal degrees)	51.49028 N, 117.49167 W
Altitude	2647
Local Basin Name	Ventego Cr.
	Columbia
Stream Order	5



Figure 1. Location Map

- Across Reach (No image found)
- Aerial (No image found)
- Down Stream (No image found)
- Field Sheet (No image found)
- Miscellaneous (No image found)
- Substrate (No image found)
- Up Stream (No image found)

Cabin Assessment Results

		Reference Model Summary				
Model	Columbia-Okanagan Preliminary March 2010					
Analysis Date	November 01, 2017					
Taxonomic Level	Family					
Predictive Model Variables	Depth-Avg Latitude Longitude Reg-Ice Reg-SlopeLT30%					
Reference Groups	1	2	3	4	5	
Number of Reference Sites	9	43	17	12	33	
Group Error Rate	22.2%	24.5%	22.2%	25.0%	32.4%	
Overall Model Error Rate	26.4%					
Probability of Group Membership	1.8%	0.0%	2.8%	7.2%	88.2%	
CABIN Assessment of NAVEN01 on Sep 17, 2012	Divergent					

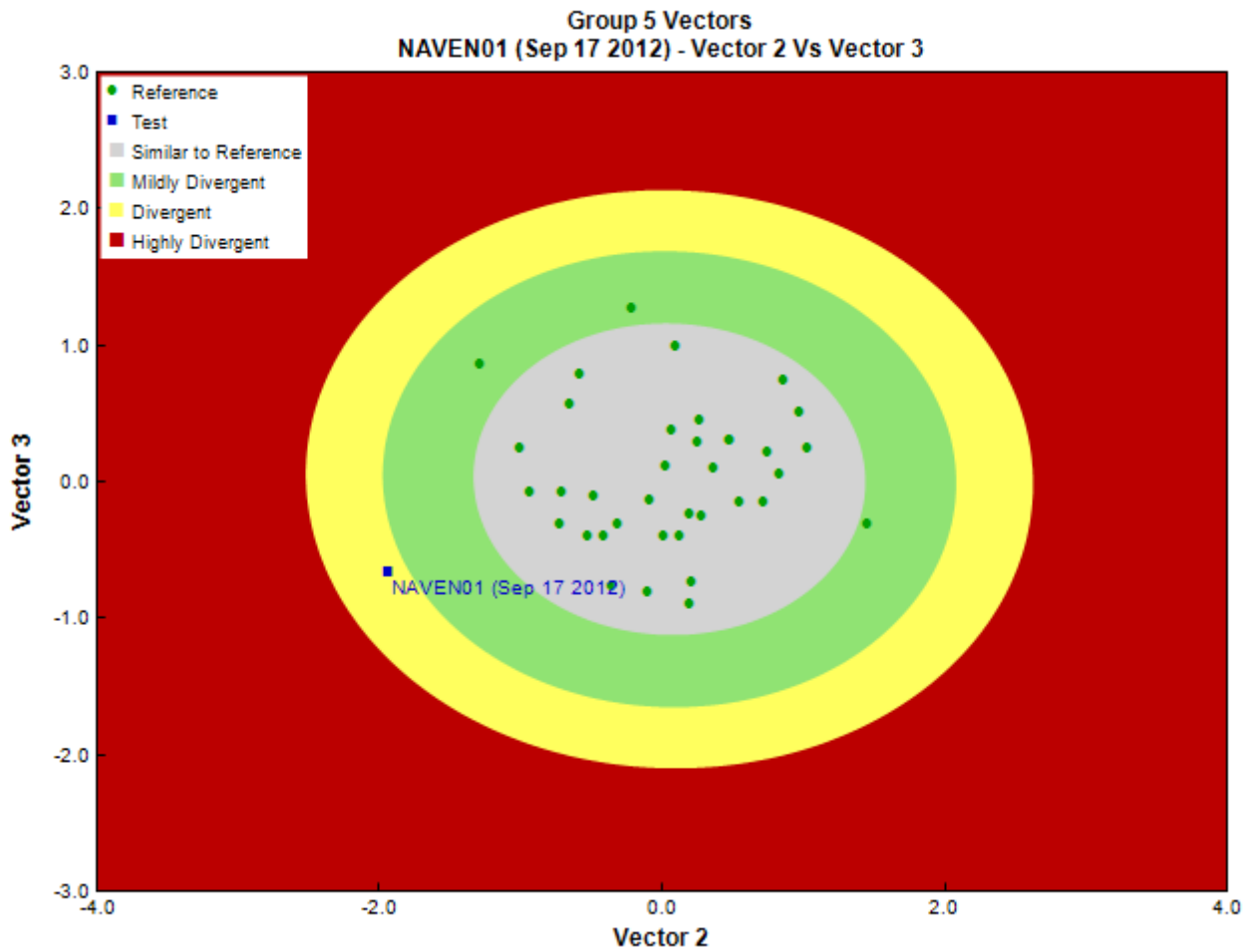


Figure 3. CABIN ordination assessment of the test site with the predicted group of reference sites. Each axis represents the relative abundance of the entire benthic invertebrate community with different organisms weighted differently on each axis.

Sample Information

Sampling Device	Kick Net
Mesh Size	400
Sampling Time	3
Taxonomist	Eco Analysts, EcoAnalysts
Date Taxonomy Completed	February 12, 2013
	Marchant Box
Sub-Sample Proportion	100/100

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count	
Arthropoda	Arachnida	Trombidiformes	Sperchontidae	5	5.0	
			Insecta	Diptera	16	16.0
				Simuliidae	3	3.0
				Tipulidae	1	1.0
		Ephemeroptera		Ameletidae	22	22.0
			Baetidae	8	8.0	
			Ephemerellidae	3	3.0	
				Heptageniidae	29	29.0
		Plecoptera		Capniidae	11	11.0
			Chloroperlidae	1	1.0	
				Leuctridae	1	1.0
				Nemouridae	5	5.0
				Perlodidae	2	2.0
				Taeniopterygidae	63	63.0
			Trichoptera	Limnephilidae	1	1.0

Community Structure

Phylum	Class	Order	Family	Raw Count	Total Count
			Rhyacophilidae	2	2.0
			Total	173	173.0

Metrics

Name	NAVEN01	Predicted Group Reference Mean \pm SD
Bray-Curtis Distance	0.79	0.4 \pm 0.1
Biotic Indices		
Hilsenhoff Family index (North-West)	2.9	2.8 \pm 0.3
Intolerant taxa	--	1.0 \pm 0.0
Long-lived taxa	--	1.0 \pm 0.0
Tolerant individuals (%)	--	0.3
Functional Measures		
% Filterers	1.7	1.7 \pm 1.7
% Gatherers	64.2	50.6 \pm 14.6
% Predatores	16.8	15.3 \pm 9.0
% Scrapers	60.7	67.2 \pm 16.8
% Shredder	47.4	38.1 \pm 18.2
No. Clinger Taxa	12.0	19.8 \pm 3.4
Number Of Individuals		
% Chironomidae	9.2	4.6 \pm 5.0
% Coleoptera	0.0	0.0 \pm 0.0
% Diptera + Non-insects	14.5	6.3 \pm 5.3
% Ephemeroptera	35.8	44.9 \pm 17.3
% Ephemeroptera that are Baetidae	12.9	26.1 \pm 20.5
% EPT Individuals	85.5	93.7 \pm 5.3
% Odonata	--	0.0 \pm 0.0
% of 2 dominant taxa	53.2	60.2 \pm 11.4
% of 5 dominant taxa	81.5	84.5 \pm 5.9
% of dominant taxa	36.4	39.3 \pm 12.3
% Plecoptera	48.0	42.9 \pm 17.2
% Tribe Tanyatarisini	--	
% Trichoptera that are Hydropsychida	0.0	27.4 \pm 27.1
% Tricoptera	1.7	5.8 \pm 5.7
No. EPT individuals/Chironomids+EPT Individuals	0.9	1.0 \pm 0.1
Total Abundance	173.0	2163.6 \pm 1274.4
Richness		
Chironomidae taxa (genus level only)	1.0	0.9 \pm 0.2
Coleoptera taxa	0.0	0.1 \pm 0.2
Diptera taxa	3.0	2.4 \pm 1.0
Ephemeroptera taxa	4.0	3.7 \pm 0.5
EPT Individuals (Sum)	148.0	2023.9 \pm 1195.7
EPT taxa (no)	12.0	12.3 \pm 1.9
Odonata taxa	--	0.0 \pm 0.0
Pielou's Evenness	0.7	0.7 \pm 0.1
Plecoptera taxa	6.0	5.5 \pm 1.1
Shannon-Wiener Diversity	2.0	1.9 \pm 0.3
Simpson's Diversity	0.8	0.8 \pm 0.1
Simpson's Evenness	0.3	0.3 \pm 0.1
Total No. of Taxa	16.0	16.0 \pm 3.0
Trichoptera taxa	2.0	3.2 \pm 1.0

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NAVEN01
	Group 1	Group 2	Group 3	Group 4	Group 5	
Baetidae	100%	100%	100%	100%	97%	0.98
Chironomidae	100%	100%	100%	100%	95%	0.95
Chloroperlidae	78%	88%	94%	100%	100%	0.99
Ephemerellidae	78%	100%	100%	100%	100%	1.00
Heptageniidae	100%	100%	100%	100%	100%	1.00
Hydropsychidae	11%	92%	78%	92%	86%	0.85

Frequency and Probability of Taxa Occurrence

Reference Model Taxa	Frequency of Occurrence in Reference Sites					Probability Of Occurrence at NAVEN01
	Group 1	Group 2	Group 3	Group 4	Group 5	
Nemouridae	100%	100%	100%	100%	100%	1.00
Perlodidae	78%	78%	89%	92%	81%	0.82
Rhyacophilidae	100%	92%	100%	100%	95%	0.95
Taeniopterygidae	89%	49%	100%	92%	97%	0.97

RIVPACS Ratios

RIVPACS : Expected taxa P>0.50	12.60
RIVPACS : Observed taxa P>0.50	13.00
RIVPACS : O:E (p > 0.5)	1.03
RIVPACS : Expected taxa P>0.70	9.51
RIVPACS : Observed taxa P>0.70	9.00
RIVPACS : O:E (p > 0.7)	0.95

Habitat Description

Variable	NAVEN01	Predicted Group Reference Mean \pm SD
Bedrock Geology		
Alluvium (%)	0.00000	0.00000 \pm 0.00000
Intrusive (%)	0.00000	0.46153 \pm 2.09955
Metamorphic (%)	14.92744	0.17691 \pm 0.85012
Sedimentary (%)	85.07256	99.36155 \pm 2.22799
Ultramafic (%)	0.00000	0.00000 \pm 0.00000
Volcanic (%)	0.00000	0.00000 \pm 0.00000
Channel		
Depth-Avg (cm)	27.3	21.5 \pm 9.7
Depth-BankfullMinusWetted (cm)	46.00	38.14 \pm 36.11
Depth-Max (cm)	51.0	31.0 \pm 16.5
Macrophyte (PercentRange)	0	0 \pm 0
Reach-%CanopyCoverage (PercentRange)	1.00	1.54 \pm 1.28
Reach-DomStreamsideVeg (Category (1-4))	3	3 \pm 1
Reach-Pools (Binary)	0	1 \pm 0
Reach-Rapids (Binary)	1	0 \pm 0
Reach-Riffles (Binary)	1	1 \pm 0
Reach-StraightRun (Binary)	0	0 \pm 1
Slope (m/m)	0.3500000	0.0581357 \pm 0.0554952
Veg-Coniferous (Binary)	1	1 \pm 0
Veg-Deciduous (Binary)	1	1 \pm 0
Veg-GrassesFerns (Binary)	1	1 \pm 0
Veg-Shrubs (Binary)	1	1 \pm 0
Velocity-Avg (m/s)	0.69	0.51 \pm 0.27
Velocity-Max (m/s)	1.33	0.78 \pm 0.40
Width-Bankfull (m)	14.9	13.7 \pm 16.4
Width-Wetted (m)	14.2	9.0 \pm 13.1
XSEC-VelMethod (Category (1-3))	1	2 \pm 1
Climate		
Precip01_JAN (mm)	178.66667	130.45668 \pm 67.17180
Precip02_FEB (mm)	145.00000	102.48242 \pm 52.12836
Precip03_MAR (mm)	130.66667	89.80929 \pm 42.79174
Precip04_APR (mm)	178.66667	135.11134 \pm 66.06707
Precip05_MAY (mm)	78.33333	70.51109 \pm 13.79432
Precip06_JUN (mm)	102.66667	86.65922 \pm 19.93623
Precip07_JUL (mm)	97.66667	79.11475 \pm 19.88523
Precip08_AUG (mm)	95.33333	76.86606 \pm 21.34619
Precip09_SEP (mm)	90.33333	71.16784 \pm 23.11306
Precip10_OCT (mm)	124.66667	88.14083 \pm 44.84739
Precip11_NOV (mm)	185.33333	134.64587 \pm 63.61897
Precip12_DEC (mm)	190.00000	142.32359 \pm 65.85239
PrecipTotal_ANNUAL (mm)	1510.33333	1143.02476 \pm 453.62461
Temp01_JANMax (Degrees Celsius)	-7.66667	-6.18206 \pm 1.69263
Temp01_JANmin (Degrees Celsius)	-14.00000	-13.62029 \pm 2.05208

Habitat Description

Variable	NAVEN01	Predicted Group Reference Mean \pm SD
Temp02_FEBmax (Degrees Celsius)	-5.33333	-2.89816 \pm 1.88421
Temp02_FEBmin (Degrees Celsius)	-12.00000	-11.14625 \pm 1.99282
Temp03_MARmax (Degrees Celsius)	-1.66667	0.98920 \pm 2.35950
Temp03_MARmin (Degrees Celsius)	-9.33333	-7.98295 \pm 1.94687
Temp04_APRmax (Degrees Celsius)	2.00000	5.37616 \pm 3.02243
Temp04_APRmin (Degrees Celsius)	-5.33333	-3.74673 \pm 1.66191
Temp05_MAYmax (Degrees Celsius)	6.66667	10.12548 \pm 3.18022
Temp05_MAYmin (Degrees Celsius)	-1.00000	0.09616 \pm 1.15628
Temp06_JUNmax (Degrees Celsius)	10.00000	13.85415 \pm 3.23839
Temp06_JUNmin (Degrees Celsius)	1.33333	2.79527 \pm 1.60213
Temp07_JULmax (Degrees Celsius)	13.66667	17.45582 \pm 3.27590
Temp07_JULmin (Degrees Celsius)	3.66667	4.99257 \pm 1.52992
Temp08_AUGmax (Degrees Celsius)	13.66667	17.36896 \pm 3.11866
Temp08_AUGmin (Degrees Celsius)	4.00000	4.84827 \pm 1.46649
Temp09_SEPmax (Degrees Celsius)	8.66667	12.13974 \pm 2.86510
Temp09_SEPmin (Degrees Celsius)	0.33333	1.12535 \pm 1.20660
Temp10_OCTmax (Degrees Celsius)	2.00000	5.04078 \pm 2.46521
Temp10_OCTmin (Degrees Celsius)	-3.66667	-2.41023 \pm 1.18961
Temp11_NOVmax (Degrees Celsius)	-4.33333	-2.24818 \pm 1.93047
Temp11_NOVmin (Degrees Celsius)	-9.66667	-8.35137 \pm 1.96467
Temp12_DECmax (Degrees Celsius)	-8.00000	-6.49458 \pm 1.76429
Temp12_DECmin (Degrees Celsius)	-13.66667	-12.72330 \pm 1.87798
TempANNUALmax (Degrees Celsius)	2.00000	5.16639 \pm 2.57569
TempANNUALmean (Degrees Celsius)	-1.00000	0.71683 \pm 1.81248
TempANNUALmin (Degrees Celsius)	-4.66667	-3.38604 \pm 1.60598
Hydrology		
Drainage-Area (km ²)	195.31267	135.66658 \pm 373.96803
Perimeter (Km)	96.65142	55.78285 \pm 83.00734
StreamDensity (m/km ²)	1667.21468	2198.74079 \pm 886.68339
StreamLength (m)	325628.15	293250.33 \pm 851854.38
Landcover		
Natl-AnnCrops (%)	0.00000	0.00000 \pm 0.00000
Natl-Barren (%)	0.00000	0.00000 \pm 0.00000
Natl-BroadleafDense (%)	0.00000	0.00523 \pm 0.02638
Natl-BroadleafOpen (%)	2.09832	1.35705 \pm 2.04550
Natl-BroadleafSparse (%)	0.50690	0.31953 \pm 0.53788
Natl-Coniferous (%)	0.00000	0.00000 \pm 0.00000
Natl-ConiferousDense (%)	1.84033	4.95677 \pm 7.46543
Natl-ConiferousOpen (%)	29.44389	34.34335 \pm 18.65764
Natl-ConiferousSparse (%)	2.56336	1.39163 \pm 1.60111
Natl-Deciduous (%)	0.00000	0.00000 \pm 0.00000
Natl-Developed (%)	0.00000	0.00002 \pm 0.00009
Natl-ExposedLand (%)	24.08044	16.95282 \pm 9.64125
Natl-Grassland (%)	9.86480	5.60615 \pm 5.17505
Natl-Herb (%)	0.50117	2.04978 \pm 2.79736
Natl-MixedForest (%)	0.00000	0.00000 \pm 0.00000
Natl-MixedwoodDense (%)	0.06556	0.02636 \pm 0.08976
Natl-MixedwoodOpen (%)	1.09013	2.10440 \pm 2.63686
Natl-MixedwoodSparse (%)	0.07529	0.01817 \pm 0.04448
Natl-PerennCropsPast (%)	0.00000	0.00000 \pm 0.00000
Natl-Rock/Rubble (%)	6.67023	6.97447 \pm 7.52078
Natl-Shrubland (%)	0.00000	0.00000 \pm 0.00000
Natl-ShrubLow (%)	2.49249	4.49178 \pm 5.44294
Natl-ShrubTall (%)	0.00000	0.33533 \pm 1.14136
Natl-SnowIce (%)	16.84775	7.70046 \pm 9.06096
Natl-Water (%)	0.80714	0.14384 \pm 0.45543
Natl-Wetland (%)	0.00000	0.00000 \pm 0.00000
Natl-WetlandHerb (%)	0.00000	0.00639 \pm 0.02401
Natl-WetlandShrub (%)	0.01600	0.00868 \pm 0.02574
Natl-WetlandTreed (%)	0.00000	0.00226 \pm 0.00959
Reg-Ice (%)	0.00000	3.06094 \pm 5.65390
Sediment Chemistry		

Habitat Description

Variable	NAVEN01	Predicted Group Reference Mean \pm SD
Ag (ppm)	0.083	0.000 \pm 0.000
Al (ppm)	34100000.000	0.007 \pm 0.007
As (ppm)	8.750	0.001 \pm 0.001
Ba (ppm)	115.000	0.111 \pm 0.082
Be (ppm)	0.400	0.000 \pm 0.000
Bi (ppm)	0.100	0.000 \pm 0.000
Ca (ppm)	652000000.000	23.071 \pm 17.129
Cd (ppm)	0.567	0.000 \pm 0.000
Co (ppm)	5.710	0.000 \pm 0.000
Cr (ppm)	7.700	0.000 \pm 0.000
Cu (ppm)	10.500	0.000 \pm 0.000
Fe (ppm)	244000000.000	0.005 \pm 0.003
Hg (ppm)	0.050	0.000 \pm 0.000
K (ppm)	6150000.000	0.325 \pm 0.299
Li (ppm)	5.900	0.001 \pm 0.001
Mg (ppm)	118000000.000	7.667 \pm 6.332
Mn (ppm)	420.000	0.000 \pm 0.000
Mo (ppm)	3.030	0.001 \pm 0.000
Na (ppm)	1000000.000	0.889 \pm 0.729
Ni (ppm)	15.500	0.000 \pm 0.000
Pb (ppm)	5.480	0.000 \pm 0.000
Sb (ppm)	0.470	0.000 \pm 0.000
Se (ppm)	0.500	0.000 \pm 0.000
Sn (ppm)	0.210	0.000 \pm 0.000
Sr (ppm)	47.300	0.082 \pm 0.102
Ti (ppm)	99.900	0.001 \pm 0.000
Tl (ppm)	0.208	0.000 \pm 0.000
TP (ppm)	419.000	0.000 \pm 0.000
U (ppm)	1.210	0.000 \pm 0.000
V (ppm)	15.100	0.000 \pm 0.000
Zn (ppm)	71.400	0.001 \pm 0.001
Zr (ppm)	3.840	0.000 \pm 0.000
Substrate Data		
%Bedrock (%)	0	1 \pm 1
%Boulder (%)	1	3 \pm 3
%Cobble (%)	53	64 \pm 17
%Gravel (%)	5	2 \pm 2
%Pebble (%)	41	31 \pm 16
%Sand (%)	0	0 \pm 0
%Silt+Clay (%)	0	0 \pm 0
D50 (cm)	7.25	19.61 \pm 30.65
Dg (cm)	6.8	20.3 \pm 30.8
Dominant-1st (Category(0-9))	6	7 \pm 1
Dominant-2nd (Category(0-9))	5	6 \pm 1
Embeddedness (Category(1-5))	3	4 \pm 1
PeriphytonCoverage (Category(1-5))	2	2 \pm 1
SurroundingMaterial (Category(0-9))	3	3 \pm 1
Topography		
ElevationMax (m)	3194.00000	2829.64865 \pm 315.67549
ElevationMin (m)	780.00000	1172.81081 \pm 249.32284
ElevationStdev (m)	428.97217	342.56455 \pm 77.02221
Reg-SlopeLT30% (%)	9.00000	16.26604 \pm 8.50298
Slope30-50% (%)	25.64639	28.13773 \pm 4.86732
Slope50-60% (%)	12.36173	14.11202 \pm 1.82185
SlopeAvg (%)	54.70691	56.75540 \pm 7.27461
SlopeGT60% (%)	38.30637	39.57775 \pm 9.82818
SlopeLT30% (%)	23.68551	18.17250 \pm 6.88627
SlopeMax (%)	491.57861	317.81636 \pm 141.61151
SlopeMin (%)	0.00000	0.79557 \pm 1.30240
SlopeStdev (%)	32.07930	29.56849 \pm 5.64880
Water Chemistry		
General-Alkalinity (mg/L)	27.2000000	68.5944444 \pm 52.1098452

Habitat Description

Variable	NAVEN01	Predicted Group Reference Mean \pmSD
General-DO (mg/L)	10.000000	11.0635135 \pm 0.9899052
General-pH (pH)	9.7	7.7 \pm 0.7
General-SpCond (μS/cm)	95.000000	160.3567568 \pm 118.4083015
General-TempAir (Degrees Celsius)	9.0	10.5 \pm 0.7
General-TempWater (Degrees Celsius)	6.500000	5.5262162 \pm 1.8860693
General-Turbidity (NTU)	3.510000	0.1015000 \pm 0.0459619
Nitrogen-NO2 (mg/L)	0.005000	0.0074306 \pm 0.0217095
Nitrogen-NO2+NO3 (mg/L)	0.107000	0.0315000 \pm 0.0316491
Nitrogen-NO3 (mg/L)	0.107000	0.0699722 \pm 0.0547511
Phosphorus-OrthoP (mg/L)	0.005000	0.0008750 \pm 0.0012583